Quality control systems for compact disc production

CD-RW/DVD-RW

 thickness and complex refractive index monitoring for the complete layer stack

DVD

VD substrate thickness anding layer thickness we layer thickness

CD-R

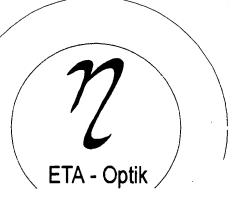
- dye-coating proces inc
- groove geometry in substrate
 and dye coated surface
- CD-R simulation software

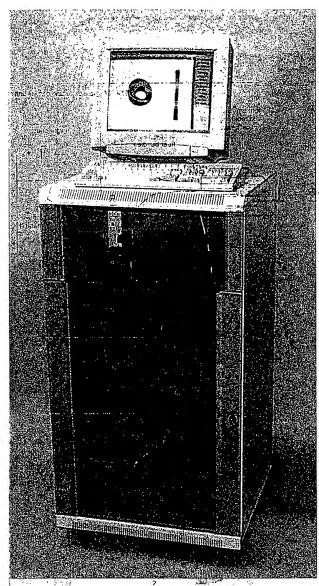
CD

CD protective layer thickness

CD dishing angle

CD birefringence





ETA-RT measuring system

The measuring table consists of

scan table with 1 translatory and 1 rotatory variant

R/T measuring head with various reference samples

ETA-F-R/R optical fibers

The spectrometer unit consists of

- 2 ETA-CS-D256
- 1 ETA-HL-35
- 2 ETA-SD-R/W
- 2 ETA-MC-IO 1 ETA-P-35
- diode lin spectrometers
- 35_W halogen light source
- stepper-motor drives microcontroller modules
- 35 W power supply

The optical measurement system **ETA-RT** is a multifunctional quality control system with high accuracy of m asurement to determine various process relevant parameters in modern compact disc production.

ูลเดาเราอ่าง oitenotia The main tasks of the *ETA-RT* system are: วะสาราชออร์ เลยา เป็น ระสาชอาสา

- CD-RW / DVD-RW layer stack controlling
- DVD substrate, bonding and semireflectiv layer thickness evaluation light to return the process of the pro
- CD-R dye coating process monitoring and groove geometry determination with a strategy
- CD protective layer thickness, birefringence and dishing angle measurements.

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System setup: enal in office as noted from

The *ETA-RT* measuring system is built up strictly modulary so that the user is able to adapt and extend it according to personal as well as future requirements. Depending on customers needs a later enlargement of the *ETA-RT* system can be achieved by registering additional software modules and installing additional hardware components.

The **ETA-RT** basic measuring system is available in two different hardware setups:

- System in 19" table rack for external PC, with spectrometer unit, measuring table and basic spectrometer software (without PC)
- System in 19" tower rack with internal PC, spectrometer unit, measuring table and installed basic spectrometer software

scanning table optical fibers

stepper motor connection

spectrometer unit

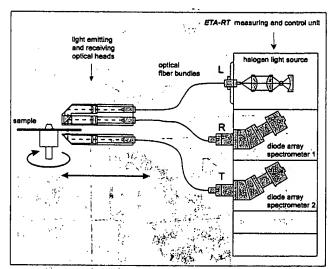
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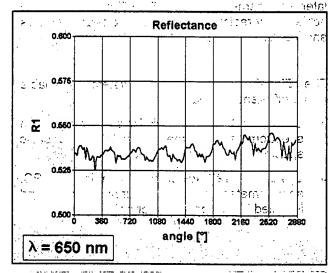
- high resolution spectral reflectance (R) and transmittance (T) measurement
- automatic referencing

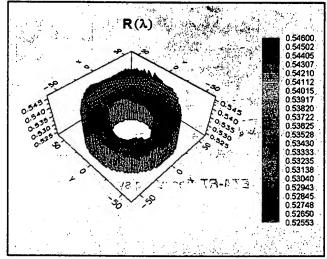
LOODEN END

- measuring rate 100 full spectra 7 sec 200 months and T
- user defined measuring and reference : wavelengths (range: 450 ... 1000 nm) (CO) c
- computer controlled scanning table (angular and radial position) adapted to CD-production for complete disc scanning ... v. ເປັນ ເປັນ ຄະດວາຍ
- eogscanning rate 3 Hz/dig result is thistong CO
- graphical measurement representation (2D, 3D and false color graphs)
- application specific software modules for CD-RW, DVD-RW stack control and DVD, CD-R etc. thickness determination acress the set of the set modulary so that the second modulary

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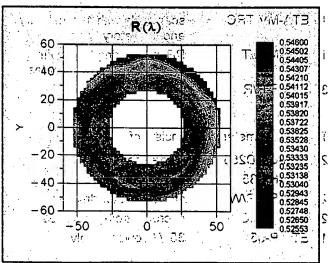


statistical data evaluation according to red/ orange book specifications

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interface to STEAG HamaTech machines for inline production control

1.11200



Data evaluation software modules

Module	Parameter		Resolution	
	R(λ)	Reflectance	0.1 %	
ETA-RT	Τ(λ)	Transmittance	0.1 %	
basic software	Α(λ)	Absorbance		
	$R(\lambda_1)/R(\lambda_2)$	Ratio	·	

The following additional software modules are available:

Module		Parameter	used spectra	Resolution
CD-R	d, n(λ), κ(λ)	CD-R dye layer thickness and material parameters	R and T	± 1 nm
CD-R-SIM		CD-R simulation software		
CD-RW	d, $n(\lambda)$, $\kappa(\lambda)$	phase change and buffer layer thickness and material parameters	R and T	± 0.5 nm
DVD-ML	d	semireflective layer thickness	RorT	± 0.5 nm
DVD-RW DVD-RAM	d, $n(\lambda)$, $\kappa(\lambda)$	phase change and buffer layer thickness and material parameters	R and T	± 0.5 nm
CD30	d	CD protective layer thickness	R	± 0.1 µm

Further extention modules requiring additional hardware components

Module	Parameter		Hardware	Resolution	
DVD80	d	DVD bonding layer thickness	high resolution spectrometer (R)	± 0.1 µm	
DVD600	d	DVD substrate thickness	high resolution spectrometer (T)	± 1.0 µm	
Diffractometer	d, w	groove geometry (depth and width) in substrate and dye coated surface	levelingmeter	± 2.0 nm (d) ± 4.0 nm (w)	
Dishing	α	radial and angular tilt	dishing sensor	± 0.01°	
Birefringence	b	birefringence	birefringence sensor	± 10 nm	

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